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# MEASUREMENT OF LEARNING OUTCOMES FOR QUALITY ASSURANCE: A SYSTEMATIC APPROACH

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## ABSTRACT

Advanced program quality is the characteristic that determines the competitiveness of an Institution in the contemporary market place and is the driving force to reckon with, in making the Institution to contemplate more along quality levels of program for gaining competitive advantage. Efficient and effective management of quality of programs significantly improves the ultimate service provided to the participants in the program of study. Efficient quality management is a complex process which entails the contribution of the various assessment components towards achievement of desired Learning Outcomes (LOs). Ascertaining the desired contribution of the various components of the instructional design is of paramount importance leading to the final quality of the program.

In this paper, a systematic methodology is proposed to ascertain the levels of achievement of various Learning Outcomes (LOs) so as to ensure the ultimate program quality provided to the learners. Through enhanced levels of academic rigor, the proposed approach traces the achievement levels of LOs which is an essential information for program quality and effectiveness.

**KEYWORDS:** Quality Assurance, Learning Outcomes, outcome measurement , Learning Analytics.

## 1. INTRODUCTION:

One of the major objectives of the academic programs is to provide comprehensive knowledge and necessary skills to the learners of the program of study. The development of individual program goals, outcomes and assessments mapping with the course outcomes will help to achieve the program and institutional goals. Three is a need for establishing a monitoring mechanism to review the effectiveness of the programs regularly to ensure effectiveness of the programs offered .For each program, course syllabus is planned with a weekly breakup which includes various methods of delivering the course contents along with the learning outcomes. The faculty responsible for teaching a particular course identifies a set of course objectives and course learning outcomes which are aligned with the program expected learning outcomes. Various assessments are carefully designed appropriately for each course so as to meet the complete course syllabus and the learning outcomes..

To what extent the assessment components of the instructional design meet the desired Learning Outcomes (LOs) will decide the course quality and the combination of courses in turn decide the overall Program quality. Efficient quality management is a complex process which entails the management of the processes throughout the Teaching –Learning process flow. Ascertaining the desired quality level at each stage of the Teaching –Learning process is of paramount importance leading to the final quality of the programs. In addition, the complexity of the problem increases when more number of assessment components and the corresponding measurements of quality levels are involved. A better methodology would consider all these factors in the prediction of the quality levels at each stage of Teaching –Learning process in order to ensure the desired final program quality

## 2. METHODOLOGY :

Suppose a program is offered many times during the last few years. The structure of assessment model should ensure better alignment of the Intended Learning Outcomes with the Assessment tools used. For a typical course offered, a mapping table is developed and shown in Table 1.

**Table 1: Sample mapping of Learning Outcomes and Assessments**

| Assessment | Weightage | Mapping with Course Learning Outcomes | | |
|---|---|---|---|---|
| | | CLO1 | CLO2 | CLO3 |
| Class participation | 10% | × | × | × |
| Assignment | 20% | × | | |
| Mid-Term Exam | 20% | × | × | |
| Case Analysis | 20% | | × | × |
| Final Exam | 30% | | × | × |

The CLOs of a particular course should be mapped to the applicable PLOs of the program under consideration: and then the course learning outcomes are mapped with program learning outcomes. Alignment of course outcomes to program outcomes and program outcome achievement measurement is as shown in table 2.

**Table 2: Sample mapping of Program Learning Outcomes and CLOs**

| Program Learning Outcomes | Course Learning Outcomes | | |
|---|---|---|---|
| | CLO1 | CLO2 | CLO3 |
| Acquire skills to communicate effectively orally and in writing. | | | |
| Possess information technology and quantitative skills to use them in business and real life situations. | | | |
| Identify the cultural differences and the manner in which they influence management processes. | × | × | × |

The overall effectiveness and quality of programs are supported by an assessment system that intimately links the program goals and learning outcomes to the course offerings. We develop a database containing CLO achievement level for each course for each period. The actual level of achievement for CLOs is calculated based on the average marks scored by the batch of students for answering the questions contributing to different CLOs for each course under the purview of the program of study. The CLOs of a particular course mapped to the applicable PLOs of the program under consideration is filled with the weighted average marks scored as the entry as shown in table 3.

**Table 3: Sample PLO measurement**

| Department: Business | Course 1 | | | Course 2 | | | | Course 3 | | | | | PLO Achievement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PLO | CLO1 | CLO2 | CLO3 | CLO1 | CLO2 | CLO3 | CLO4 | CLO1 | CLO2 | CLO3 | CLO4 | CLO5 | |
| Acquire skills to communicate effectively orally and in writing | | | | 88.33 | 88.33 | | | | 81.63 | | | | 86.10 |
| Possess information technology and quantitative skills to use them in business and real life situations | | | | | 88.33 | 84.26 | 84.26 | 82.83 | | 81.63 | 80.38 | 79.33 | 83.00 |
| Identify the cultural differences and the manner in which they influence management processes. | 54.08 | 54.08 | 54.08 | | | | | | | | | | 54.08 |

This mapping is to be done for all the courses comprising the program of study.

Then for each PLO, find the weighted average of all the courses contributing to the particular PLO. Suppose the program has 10 PLOs. Then for PLO1, the weighted average of marks of all the courses contributing to PLO1 gives the Achievement Score for PLO1.

**3. RESULTS AND DISCUSSION:**

The process of assessing the overall performance of the program and achievement of program outcomes are reported for all PLOs.

Then, we look at the PLO Achievement Score.

- If the Achievement score is > 80 implies High achievement
- If the Achievement score is between 70 and 80 implies medium achievement
- If the Achievement score is < 70 implies Low achievement

Based on the actual score, we can infer the low performing PLOs and find out the remedial measures to set right the same in the upcoming period.

By taking necessary steps to focus on the identified shortages of different CLOs, the quality standards can be enhanced to that extent.

All these individual course assessment forms are compiled into a database to establish the pattern of achievement levels of various program for quality assurance. The assessments are used to guide each program in improving the services they deliver both academically and administratively.

**4. CONCLUSION:**

Efficient and effective management of quality of programs significantly improves the ultimate service provided to the participants in the program of study. Efficient quality management is a complex process which entails the contribution of the various assessment components towards achievement of desired Course Learning Outcomes. Ascertaining the desired contribution of the various components of the instructional design is of paramount importance leading to the final quality of the program.

In this paper, a methodology is proposed and implemented to assess to what extent the assessment components of the instructional design meets the desired Course Learning Outcomes for different courses so as to ensure the ultimate quality of the program provided to the participants. The proposed approach uses Learning Analytics to capture the emerging pattern of achievement levels of Learning Outcomes which is an essential information for program quality and effectiveness. By taking necessary steps to focus on the identified shortages of different LOs the quality standards can be enhanced to the desired level.

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